

## MESUR Pathfinder Science investigations

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\*. The MESUR (Mars Environmental SURvey) Pathfinder mission is the first Discovery mission planned for launch in 1996. MESUR Pathfinder is designed as an engineering demonstration of the entry, descent and landing approach to be employed by the follow-on MESUR Network mission, which will land of order 10 small stations on the surface of Mars to investigate interior, atmospheric and surface properties. Pathfinder is a small Mars lander, equipped with a microrover to deploy instruments and explore the local landing site. instruments selected for Pathfinder include a surface imager on a 1 m pop-up mast (stereo with spectral filters), an atmospheric structure instrument/surface meteorology package, and an alpha proton x-ray spectrometer. The microrover will carry the alpha proton x-ray spectrometer to a number of different rocks and surface materials and provide close-up imaging. The scientific objectives and investigations afforded by Pathfinder include: surface morphology and geology at meter scale, elemental composition and mineralogy of surface materials and a variety of atmospheric science investigations. The surface imaging system will reveal the geologic processes and surface-atmosphere interactions at a scale Currently known only at the two Viking landing sites. The alpha proton x-ray spectrometer and the spectral filters on the imaging system will determine the elemental composition and mineralogy of surface materials, which can be used to address questions concerning the composition of the crust, its differentiation and the development of weathering products. These investigations will represent a calibration point ("ground truth") for orbital remote sensing observations. in addition, a series of small magnets and a reference test chart will determine the magnetic component of the martian dust and any deposition of airborne dust over time. The atmospheric structure instrument will determine a pressure, temperature and density profile of the atmosphere (with respect to altitude) during entry and descent at a new location, time and season. Diurnal variations of the atmospheric boundary layer will be characterized by regular surface meteorology measurements (pressure, temperature, atmospheric opacity, and wind direction). in addition, the imager will determine dust particle size and shape and water vapor abundance from sky and solar spectral observations.

1. 1993 Fall Meeting
2. 001313993
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4. P
5. (a) P02 Mars at the Threshold  
of a New Era of Exploration  
  
(b) 5470 Surfaces  
5410 Composition  
5445 Meteorology  
5494 Instruments and  
techniques  
5499 General or  
miscellaneous
6. Oral presentation
7. (%)
8. \$50 Check Enclosed
9. I (by Special Session Convener  
J. Bell)
10. Schedule before other MESUR  
Pathfinder science papers
11. No